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MEMORANDUM TO THE HONORABLE MEMBERS OF THE EIGHTY-FOURTH
GENERAL ASSEMBLY

SUBJECT: House Joint Resolution 171 - Traffic Engineering and
Feasibility Study for the Construction of a Toll
Highway between Interstate 55 and Interstate 80 in
Will County

House Joint Resolution 171, adopted July 1, 1984, directed the Department of Transportation, with the assistance and cooperation of the Illinois State Toll Highway Authority, to identify and preserve the highway corridor and to conduct a feasibility study for the construction of a toll highway from the present terminus of the North-South Tollway at I-55 to I-80 near New Lenox in Will County.

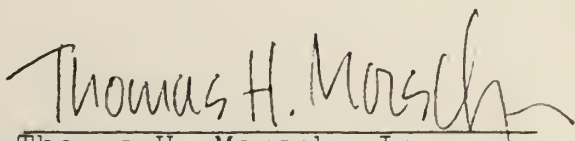
Included with this transmittal is a final report, "Proposed North-South Tollway Extension Alternatives, Will County." This report is based on the previous preliminary feasibility study of the proposed facility and includes enhanced socioeconomic data which reflect greater land use and higher employment and population projections in the corridor than were used before. The finding of this report is that the proposed extension of the North-South Tollway is not currently feasible.

However, it is recognized that construction of the North-South Tollway between Army Trail and Interstate 55 could stimulate development in Will County making the proposed extension more feasible over the long term. The possibility has been included in the design process and the North-South Tollway interchange at I-55 will be constructed in such a manner as to allow modification if the extension is warranted. The Toll Authority and Illinois Department of Transportation will continue to monitor conditions in the corridor. Additional measures will be taken to protect the necessary right-of-way until the feasibility of this extension is sufficiently improved to warrant further development of this project.

The Department and the Authority are available to answer any questions you may have regarding this report.



Gregory W. Baise, Secretary
Illinois Department of
Transportation



Thomas H. Morsch, Jr.
Executive Director
Illinois State Toll Highway
Authority

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TRAFFIC AND REVENUE IMPACT STUDY

PROPOSED NORTH-SOUTH TOLLWAY EXTENSION ALTERNATIVES

WILL COUNTY

prepared for

ILLINOIS STATE TOLL HIGHWAY AUTHORITY

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ILLINOIS DEPARTMENT OF TRANSPORTATION

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Chapter 1

INTRODUCTION

The Illinois State Toll Highway Authority (ISTHA) in cooperation with the Illinois Department of Transportation is planning to build a 17.4-mile expressway-type tollroad called the North-South Tollway that would connect Army Trail Road in Bloomingdale Township with Interstate-55 in DuPage Township. With the exception of the southernmost 1.5 miles in Will County, the proposed North-South Tollway would be located within DuPage County. This report presents the findings of a study that determined the traffic and revenue impacts as well as the overall project feasibility that would result from either of two alternate North-South Tollway alignments extending southward into Will County from the present terminus at Interstate-55. For comparison purposes, the traffic and revenue impacts and overall project feasibility of the proposed North-South Tollway is also included in the report. The three alternate projects being evaluated in this report are designated and defined as follows:

- Alternate 1 - North-South Tollway from Army Trail Road to Interstate-55 (Length 17.4 miles);
- Alternate 1A - North-South Tollway from Army Trail Road to Interstate-55 with an extension southward, to Archer Avenue (State Route 171, Length 22.1 miles); and
- Alternate 2 - North-South Tollway from Army Trail Road to Interstate-55 with an extension southward, to Interstate-80 (Length 30.0 miles).

The study keyed, to the maximum extent possible, to the traffic model and basic assumptions used in the 1983 Preliminary

Feasibility Study⁽¹⁾ with the exception of one item. A revised trip table (2005-level), based on updated socioeconomic planning data that recognized the influence a North-South Tollway extension to Interstate-80 would have on development in Will County, was used to evaluate the feasibility of each alternate, North-South Tollway alignment. The feasibility of both Alternate 1 and Alternate 2 were examined as part of the 1983 Preliminary Feasibility Study.

Revisions In Socioeconomic Data

When the 1983 Preliminary Feasibility Study was conducted, an official socioeconomic data forecast prepared by the Northern Illinois Planning Commission (NIPC) was used as input to the travel demand modeling process. This set of projected socioeconomic data did not reflect the impact on land-use patterns that a major roadway facility such as the North-South Tollway may have. To test the assumption that this increased development may be an important factor, the Will County Development Department, in cooperation with the communities in the North-South Tollway corridor south of I-55, prepared a targeted scenario development plan.

This new socioeconomic data file assumed the North-South Tollway in place and that local plans would reflect this development. Due to a short time frame for the analysis and the test nature of the data file, the total development in Will County

(1) Preliminary Tollway Feasibility Study, Elgin-O'Hare Corridor and Illinois Route 53 Corridor, prepared for Illinois Department of Transportation and Illinois State Toll Highway Authority, by Envirodyne Engineers, Inc., and Wilbur Smith and Associates, 1983.

was allowed to exceed the control totals existing in the base files at NIPC. If this test indicated that the North-South Tollway was potentially viable in Will County, then the Will County Development Department would proceed to reallocate residential and commercial development within the county, subject to NIPC control totals for the county.

A new forecast file for 2005 was prepared for households and employment at the quarter-section level by the Will County Development Department and NIPC. This assumes the North-South Tollway is built from Interstate-55 to Interstate-80 and that this is reflected in local land-use plans. This was then summarized into Chicago Area Transportation Study (CATS) zone and geographic township format for further analysis. Township and county summaries for both the "Official NIPC" and "targeted Development Scenario" forecasts are shown in Table 1. (Note that the county and township total differences vary due to the inclusion of Lemont which is in Cook County.) Corridor households increase by 22,299 or 22.5 percent and the employment is higher by 32,244 or 30.1 percent. The largest increases in households were in DuPage and Lockport townships.

CATS generated factors to be used to produce a revised set of year 2005 trip tables, based on the trip tables that were used in the 1983 Feasibility Study. Household and employment figures showed increasing values in comparison with official NIPC estimates. As such, the number of trips in Will County, as well as throughout the entire project corridor, were increased.

Table 1
SUMMARY OF YEAR 2005
SOCIOECONOMIC DATA

	SIX TOWNSHIP TOTALS ⁽¹⁾		WILL COUNTY TOTAL	
	<u>Households</u>	<u>Employment</u>	<u>Households</u>	<u>Employment</u>
Official NIPC Forecasts	98,901	107,156	138,851	172,368
Targeted Develop- ment Scenario	<u>121,200</u>	<u>139,400</u>	<u>161,150</u>	<u>204,612</u>
Difference	22,299	32,244	22,299	32,244
Percent Increase	22.5	30.1	16.1	18.7

(1) DuPage, Lockport, Homer, Joliet and New Lenox Townships
in Will County and Lemont Township in Cook County.

SOURCE: CATS

Chapter 2

METHODOLOGY

Two 2005-level traffic assignments were performed to evaluate the design year (2007) traffic and revenue impacts that the revised planning data would have on the Alternate 1 and Alternate 2 project configurations. The same Alternate 1 and 2 traffic networks that were used in the 1983 Preliminary Feasibility Study were also used for this update. No updates whatsoever have been made to those networks for purposes of this study. Final year 2005 traffic estimates at the toll plazas were derived by making adjustments to the computer loadings as necessary in a similar manner to those that were made in the 1983 Preliminary Feasibility Study. As discussed above, factors provided by CATS were used in a fratar process to generate year 2005 trip tables from 1992-level trip tables.

Design year (2007) and opening-year (1987) toll plaza traffic estimates were determined by applying 1987 to 2005 and 2005 to 2007 growth factors to the final 2005-level traffic figures. The results of the 1980-level traffic assignments that were performed during the 1983 Preliminary Feasibility Study provided a set of base-year figures to establish growth rates. The 1987 to 2005 traffic growth factors were based on the average annual percent traffic changes between 1980 and 2005-level computer loadings. A straightlining process was used to allocate the amount of growth projected to occur between 1987 and 2005. Traffic growths from 2005 to 2007 were equivalent to those that were used in the 1983 Preliminary Feasibility Study.

Estimated toll revenues were determined from the traffic estimates assuming the same vehicle-type mix and average toll

per vehicle at the toll plazas. Assumed passenger car toll rates that were used in this study are presented in Table 2 for each alternate project configuration. These charges are consistent with the estimated optimum through trip toll rate of \$0.042 per mile as determined in the 1983 Preliminary Feasibility Study. Passenger car tolls at mainline plazas are usually \$0.40 with one notable exception. In Alternate 1A, the Archer Avenue toll is only \$0.20 out of consideration for the short additional trip length provided by Alternate 1A. At ramp plazas, passenger cars are assessed various toll charges ranging from \$0.40 to \$0.20.

Estimated opening and design year revenues were computed for Alternate 1A by means of a factoring analysis process. As a supplement to the 1983 Preliminary Feasibility Study, a traffic assignment for the Alternate 1A project configuration was performed and evaluated in the same manner as Alternates 1 and 2 using an approved 1992-level CATS trip table. For the study, annual revenue estimates for Alternate 1A were determined as follows. Factors relating the relative change between Alternate 2 annual revenues based on the "official NIPC" data versus the data in the "targeted development scenario" were computed for the opening and design years. Revised opening and design year revenue estimates for Alternate 1A, recognizing the "targeted development scenario" planning data were then obtained by applying these factors to the initial Alternate 1A findings that were based on the "official NIPC" data.

Basic Assumptions

Traffic and revenue estimates for the study's three alternate toll configurations were predicated on the following basic assumptions:

Table 2
TOLL SCHEDULE BY ALTERNATE
(Passenger Car Rates)

PLAZA LOCATION	PLAZA TYPE (1)	ALTERNATE		
		1	1A	2
Between Army Trail Rd. and North Avenue	MB	\$0.40	\$0.40	\$0.40
North Avenue	RS	0.40	0.40	0.40
Roosevelt Road	RS	0.35	0.35	0.35
Butterfield Road	RS	0.25	0.25	0.25
East-West Tollway	RS-W	0.20	0.20	0.20
Between Maple Avenue and 75th Street	MB	0.40	0.40	0.40
75th Street	RS	0.25	0.25	0.25
87th Street	RS	--	0.20	0.20
North of Archer Avenue	MB	--	0.20	0.40
State Route 7	RS	--	--	0.20

- (1) MB - denotes mainline barrier toll plaza.
 RS - denotes plaza on ramps serving the south.
 RS-W - denotes plaza on ramps serving the south to
 west quadrant movement.

- The proposed alternatives would each be fully operational and open to traffic by January 1, 1987, as toll facilities;
- The facilities would be constructed to accommodate traffic demands as set forth in this report. In addition, the section of I-290 north of its merge with State Route 53 would be widened to accommodate eight lanes based on traffic estimates;
- A closed barrier toll system prohibiting toll-free travel movements would be used;
- Toll schedules as outlined herein based on average passenger car trip costs approximately 4.2 cents per mile for full length trips;
- No new competing limited access facilities will be constructed in the study corridor;
- The proposed toll facilities will be effectively signed, adequately maintained and efficiently operated to encourage maximum usage;
- Recovery from the recent economic slowdown will continue and no national emergency which might restrict the use of motor vehicles would be anticipated; and
- The availability and price of gasoline will continue in a stable trend.

Another factor essential to evaluating the relative feasibility of the three alternate project configurations is the assumed degree of access afforded by each proposed alternative. In Alternate 1, full access interchanges would exist with the following crossroads:

- Army Trail Road;
- North Avenue;
- Roosevelt Road;
- Butterfield Road;
- East-West Tollway;
- Maple Avenue; and
- 75th Street.

In addition, partial access to and from the south would be provided at Ogden Avenue while partial access serving the north would exist at Interstate-55 and 87th Street. Alternate 1A access would be the same as in Alternate 1 with additional access to and from the south at 87th Street and Interstate-55. It would also include a new partial interchange serving the north at State Route 171 (Archer Avenue) which would be the southern terminus. Alternate 2 access would be additional to that of Alternate 1A including two new partial interchanges at State Route 7 and Interstate-80, which would provide access to and from the south and north, respectively.

Departure from the above basic assumptions may have a material effect on the traffic and revenue estimates presented herein.

Chapter 3

PRELIMINARY TRAFFIC AND REVENUE ESTIMATES

Tables 3 and 4 present the findings of the updated preliminary traffic and revenue analysis using the "targeted development scenario" land-use estimates, for Alternates 1 and 2, respectively. Estimates are presented for each toll location for both 1987 and 2007, and a total revenue comparison is drawn between the estimates developed for the Preliminary Feasibility Report, and this update.

Total 1987 revenue estimates to be produced under Alternate 1, using the updated data is \$19,694,000, as shown in Table 3. This is a 9.0 percent increase over the Preliminary Feasibility Study. In 2007, estimated revenue is \$31,401,000, or 13.3 percent higher than the earlier estimate.

Updated traffic and revenue estimates for Alternate 2 are shown in Table 4. Total 1987 estimated revenue is shown to be 9.5 percent higher than in the 1983 study, at \$28,487,000. Year 2007 estimated revenue is \$43,830,000, or 12.7 percent higher than the earlier estimate.

Opening-year toll revenue that would be generated by the Alternate 1A configuration was estimated to be \$22,566,000, which is 15 percent greater than Alternate 1 and 26 percent less than Alternate 2. By the year 2007, annual toll revenue would be expected to rise to \$35,654,000 which is 14 percent above Alternate 1 and 23 percent below Alternate 2.

Annual Toll Revenues - Table 5 contains annual toll revenue estimates from 1987 to 2007 for the three alternative projects.

Table 3
ESTIMATED UPDATED PRELIMINARY TRAFFIC AND REVENUE
Alternate 1

<u>PLAZA LOCATION</u>	<u>PLAZA TYPE</u> ⁽¹⁾	<u>1987</u>		<u>2007</u>	
		<u>Traffic</u>	<u>Revenue</u> (thousands)	<u>Traffic</u>	<u>Revenue</u> (thousands)
Army Trail Road	MB	42,400	\$ 6,748	65,200	\$10,376
North Avenue	RS	12,100	1,802	18,200	2,710
Roosevelt Road	RS	10,900	1,420	15,700	2,046
Butterfield Road	RS	20,100	1,927	31,000	2,987
East-West Tollway	RS-W	13,600	1,015	20,800	1,553
63rd Street	MB	34,000	5,721	59,100	9,923
75th Street	RS	<u>11,400</u>	<u>1,061</u>	<u>19,400</u>	<u>1,806</u>
Total		144,400	\$19,694	229,400	\$31,401
Total Revenue Reported in 1983 Preliminary Feasibility Study			\$18,070		\$27,710
Percent Change, Updated vs. 1983 Study			9.0		13.3

- (1) MB - denotes mainline barrier toll plaza.
RS - denotes plaza on ramps serving the south.
RS-W - denotes plaza on ramps serving the south to west quadrant movement.

Table 4
ESTIMATED UPDATED PRELIMINARY TRAFFIC AND REVENUE
Alternate 2

<u>PLAZA LOCATION</u>	<u>PLAZA TYPE (1)</u>	<u>1987</u>		<u>2007</u>	
		<u>Traffic</u>	<u>Revenue</u> (thousands)	<u>Traffic</u>	<u>Revenue</u> (thousands)
Army Trail Road	MB	44,100	\$ 7,018	69,300	\$11,041
North Avenue	RS	12,000	1,787	18,000	2,681
Roosevelt Road	RS	10,700	1,394	15,400	2,007
Butterfield Road	RS	21,800	2,101	33,800	3,257
East-West Tollway	RS-W	15,500	1,154	25,000	1,871
63rd Street	MB	43,800	7,354	66,700	11,199
75th Street	RS	<u>9,200</u>	<u>857</u>	<u>13,800</u>	<u>1,285</u>
Subtotal		157,100	\$21,665	240,700	\$33,341
87th Street	RS	12,400	\$ 923	18,900	1,407
Archer Avenue	MB	31,000	5,318	47,300	8,114
State Route 7	RS	<u>7,800</u>	<u>581</u>	<u>13,000</u>	<u>968</u>
Subtotal		51,200	\$ 6,822	79,200	\$10,489
Total		208,300	\$28,487	319,900	\$43,830
Total Revenue Re- ported in 1983 Preliminary Feasibility Study			\$26,010		\$38,890
Percent Change, Updated vs. 1983 Study			9.5		12.7

(1) MB - denotes mainline barrier toll plaza.
RS - denotes plaza on ramps serving the south.
RS-W - denotes plaza on ramps serving the south to west quadrant movement.

Table 5
ANNUAL TOLL REVENUES BY ALTERNATE
1987 to 2007

<u>YEAR</u>	<u>Alternate 1</u> (thousands)	<u>Alternate 1A</u> (thousands)	<u>Alternate 2</u> (thousands)
1987	\$19,694	\$22,566	\$28,487
1988	20,848	23,812	30,020
1989	21,959	25,031	31,520
1990	23,022	26,182	32,923
1991	24,024	27,282	34,256
1992	25,069	28,400	35,643
1993	25,532	28,968	36,338
1994	26,005	29,548	37,010
1995	26,486	30,080	37,621
1996	26,891	30,546	38,146
1997	27,302	31,019	38,678
1998	27,720	31,500	39,218
1999	28,144	31,988	39,765
2000	28,575	32,484	40,319
2001	28,963	32,919	40,803
2002	29,356	33,360	41,293
2003	29,754	33,807	41,788
2004	30,158	34,260	42,290
2005	30,567	34,720	42,797
2006	30,982	35,185	43,311
2007	31,401	35,654	43,830

As one may expect, Alternate 2 would generate more revenue than Alternates 1 and 1A since it provides the greatest level of accessibility and consists of more toll plazas. Though Alternate 2 has only one more toll collection facility than Alternate 1A, it is important to recognize that the mainline toll charged at the Archer Avenue Plaza in Alternate 2, \$0.40 per passenger car, is double the charge in Alternate 1A.

In 1987, Alternate 2 toll revenue of \$28,487,000 is \$5,921,000 and \$8,793,000, greater than those in Alternate 1A and Alternate 1, respectively. Between 1987 and 2007, annual toll revenue for Alternate 1 increases 59 percent to \$31,401,000, Alternate 1A revenue grows 58 percent to \$35,654,000, and Alternate 2 revenue rises 54 percent to \$43,830,000.

Chapter 4

UPDATED PRELIMINARY FEASIBILITY

Preliminary project feasibility was reported in the 1983 Preliminary Feasibility Study on the basis of stand-alone costs for the alternate projects in comparison to the revenues that each alternate would be expected to produce. Capital costs for Alternates 1 and 2, as well as opening-year maintenance and operating costs, were estimated by Envirodyne Engineers, Inc. (EEI) in the 1983 study. Alternate 1A project and opening-year maintenance and operating costs were also estimated by EEI based on their previous analyses in the 1983 study.

Opening-year (1987) toll revenues were related to first-year maintenance and operating expenditures to establish the net revenue available to meet estimated debt service costs. A comparative summary between the three alternative projects indicating their relative financial feasibility is presented in Table 6. The most telling information, in terms of relative financial feasibility, is displayed in the coverage ratios relating available net revenue to level debt service. Alternate 1, with a coverage ratio of 0.41, has the highest coverage rating followed by Alternate 2 and Alternate 1A with coverage ratios of 0.35 and 0.33, respectively. Although net revenues for Alternate 1A and 2 exceed that of Alternate 1, level debt service is more than proportionally higher in Alternates 1A and 2. The coverage ratios suggest that Alternate 1A is the least financially feasible alternative of the three which can be explained by the high cost of constructing the 4.7 mile section required to provide service to Archer Avenue.

Table 6
PRELIMINARY FINANCIAL FEASIBILITY
(Opening Year - 1987)

	<u>ALTERNATE 1</u>	<u>ALTERNATE 1A</u>	<u>ALTERNATE 2</u>
Project Cost ⁽¹⁾	\$270,900,000	\$366,800,000	\$447,900,000
Bond Size ⁽²⁾	\$379,260,000	\$513,520,000	\$627,060,000
Level Debt Service ⁽³⁾	\$41,058,000	\$55,592,000	\$67,884,000
Opening Year (1987) Estimated Toll Revenue	\$19,694,000	\$22,566,000	\$28,487,000
Opening Year (1987) Estimated Maintenance-Operating Expenses(1)	\$3,000,000	\$3,950,000	\$4,800,000
Opening Year (1987) Estimated Net Revenue	\$16,694,000	\$18,616,000	\$23,687,000
Coverage, Net Revenue to Debt Service	0.41	0.33	0.35

- (1) Estimated by Envirodyne Engineers.
(2) Assumes bond issue size 1.4 times project cost.
(3) Assumes 30-year bond issue, 27-year earning period and 10 percent coupon rate.

None of the coverage ratios in Table 6 imply that any one of the alternatives would approach being financially viable on a stand-alone basis. In fact, the coverage ratio values seem to suggest there is not much difference between the financial feasibility of the three projects. However, in examining the estimated revenue supplement that would be required to meet debt service coverage, the relative financial feasibility between the three alternatives is much more pronounced.

Table 7 shows the estimated opening-year revenue supplement that would be required to meet debt service coverage for each alternate project. Alternate 1 would require the least amount of supplementary funding, \$28,290,000, while Alternate 1A and Alternate 2 would need an additional \$42,291,000 and \$50,688,000, respectively. Supplementary funding required for Alternate 1A would be 49 percent and Alternate 2, 79 percent higher in comparison with Alternate 1. The relative feasibility of Alternate 1 is clearly superior to Alternates 1A and 2 in light of the amount of supplementary funding necessary to support the projects' required level debt service coverages.

Table 7
ESTIMATED REVENUE SUPPLEMENT
TO MEET REQUIRED DEBT SERVICE COVERAGE
(Opening Year - 1987)

	<u>ALTERNATE 1</u>	<u>ALTERNATE 1A</u>	<u>ALTERNATE 2</u>
Annual Toll Revenue	\$19,694,000	\$22,566,000	\$28,487,000
Annual Maintenance and Operating Expenses	\$ 3,000,000	\$ 3,950,000	\$ 4,800,000
Annual Net Revenues	\$16,694,000	\$18,616,000	\$23,687,000
Investment Income (1)	\$ 4,286,000	\$ 5,803,000	\$ 7,086,000
Total Project Income	\$20,980,000	\$24,419,000	\$30,773,000
Level Debt Service Required Coverage	\$41,058,000 1.20	\$55,592,000 1.20	\$67,884,000 1.20
Required Level Debt Service Coverage	\$49,270,000	\$66,710,000	\$81,461,000
REQUIRED SUPPLEMENT	\$28,290,000	\$42,291,000	\$50,688,000

(1) Assumed to be 0.0113 of bond issue size. See the 1983 preliminary feasibility study report.



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